

Claims

- [c1] A filter housing assembly for housing a filter member therewithin comprising:
a housing member having a substantially closed end portion and an open end portion, said housing member having a substantially hollow interior accessible from said open end portion and adaptable for receiving a filter member therewithin, said closed end portion having at least one opening extending therethrough for allowing air to enter said housing member;
a first end cap member adaptable for engaging one end portion of a filter member, said first end cap member being receivable within the interior of said housing member; and
a second end cap member adaptable for engaging the opposite end portion of a filter member, said second end cap member being engageable with said housing member and having an opening associated therewith for allowing air to exit said housing member, said first and second end cap members and said housing member forming a peripheral space around a filter member when said first end cap member and a filter member are positioned within said housing member and said second end cap member is engaged with said housing member.
- [c2] The filter housing assembly as defined in claim 1 wherein said housing member is substantially cylindrical in shape.
- [c3] The filter housing assembly as defined in claim 1 wherein said housing member is frusto-conical in shape and said substantially closed end portion is dome shaped.
- [c4] The filter housing assembly as defined in claim 3 wherein said at least one opening is positioned and located near the apex of the domed portion of said housing member.
- [c5] The filter housing assembly as defined in claim 3 wherein said at least one opening is offset from the apex of the domed portion of said housing member.
- [c6] The filter housing assembly as defined in claim 1 wherein the size of said at least one opening extending through the closed end portion of said housing

member is substantially equal to the size of the opening associated with said second end cap member.

- [c7] The filter housing assembly as defined in claim 1 wherein the size of said at least one opening extending through the closed end portion of said housing member is less than the size of the opening associated with said second end cap member.
- [c8] The filter housing assembly as defined in claim 1 wherein the size of said at least one opening extending through the closed end portion of said housing member is greater than the size of the opening associated with said second end cap member.
- [c9] The filter housing assembly as defined in claim 1 wherein said housing member includes a plurality of shoulder members associated with the interior of said housing member, said shoulder members being positioned and located to facilitate centering of a filter member within said housing member when a filter member is positioned therewithin.
- [c10] The filter housing assembly as defined in claim 9 wherein said first end cap member engages said plurality of shoulder members when positioned within said housing member.
- [c11] The filter housing assembly as defined in claim 1 wherein the closed end portion of said housing member includes a plurality of openings extending therethrough for allowing air to enter said housing member.
- [c12] A filter housing assembly for housing a filter member therewithin comprising:
 A filter housing assembly for housing a filter member therewithin comprising:
 a substantially frusto-conical shaped housing member having an open end portion and a substantially closed dome shaped portion, said housing member having a substantially hollow interior accessible from said open end portion and adaptable for receiving a filter member therewithin, said substantially closed dome shaped portion having at least one opening extending therethrough for allowing air to enter said housing member;
 a first end cap member adaptable for engaging one end portion of a filter

member and being receivable within the interior of said housing member; and a second end cap member adaptable for engaging the opposite end portion of a filter member and being engageable with the opened end portion of said housing member, said second end cap member having an opening associated therewith for allowing air to exit said housing member.

[c13] The filter housing assembly as defined in claim 12 wherein said first and second end cap members and said housing member form a peripheral space around a filter element when said first end cap member and a filter member are positioned within said housing member and when said second end cap member is engaged with the open end portion of said housing member.

[c14] The filter housing assembly as defined in claim 12 wherein said at least one opening extending through the closed dome shaped portion of said housing member is located near the apex thereof.

[c15] The filter housing assembly as defined in claim 12 wherein said at least one opening extending through the closed dome shaped portion of said housing member is offset from the apex thereof.

[c16] The filter housing assembly as defined in claim 12 wherein the size of said at least one opening extending through the closed dome shaped portion of said housing member is substantially equal to the size of the opening associated with said second end cap member.

[c17] The filter housing assembly as defined in claim 12 wherein the size of said at least one opening extending through the closed dome shaped portion of said housing member is less than the size of the opening associated with said second end cap member.

[c18] The filter housing assembly as defined in claim 12 wherein the size of said at least one opening extending through the closed dome shaped portion of said housing member is greater than the size of the opening associated with said second end cap member.

[c19] The filter housing assembly as defined in claim 12 wherein said housing

member includes a plurality of circumferentially spaced projections associated with the interior thereof, said spaced projections being positioned and located to facilitate centering of a filter member within said housing member when a filter member is positioned therewithin.

[c20] The filter housing assembly as defined in claim 19 wherein said first end cap member engages said plurality of spaced projections when positioned within said housing member.

[c21] The filter housing assembly as defined in claim 12 wherein the closed dome shaped portion of said housing member includes a plurality of openings extending therethrough for allowing air to enter said housing member.

[c22] ^m
A filter housing assembly for housing a filter member therewithin comprising:
a substantially frusto-conical shaped housing member having an open end portion associated with one end portion thereof and a dome shaped portion associated with the opposite end portion thereof, said housing member having a substantially hollow interior accessible from said open end portion and adaptable for receiving a filter member therewithin, a single opening extending through the dome shaped portion of said housing member for allowing air to enter said housing member, and a plurality of circumferentially spaced shoulder members associated with the interior of said housing member;
a first end cap member adaptable for engaging one end portion of a filter member and being insertable within the interior of said housing member, said first end cap member being engageable with said plurality of shoulder members when inserted within said housing member; and
a second end cap member adaptable for engaging the opposite end portion of a filter member, said second end cap member being engageable with said housing member and having an opening associated therewith for allowing air to exit said housing member, said first and second end cap members and said housing member forming a peripheral space around a filter member when said first end cap member and a filter member are positioned within said housing member and said first end cap member engages said plurality of shoulder members and when said second end cap member is engaged with said housing

member.

- [c23] The filter housing assembly as defined in claim 22 wherein said single opening in the dome shaped portion of said housing member is located near the apex thereof.
- [c24] The filter housing assembly as defined in claim 22 wherein a filter member includes a passageway extending therethrough, the opening associated with said second end cap member being positioned and located so as to lie in communication with the passageway extending through the filter member when said second end cap member is engaged with the opposite end portion of the filter member.
- [c25] The filter housing assembly as defined in claim 23 wherein the single opening extending through the dome shaped portion of said housing member is substantially equal to the opening associated with said second end cap member.
- [c26] The filter housing assembly as defined in claim 23 wherein the single opening extending through the dome shaped portion of said housing member is less than the opening associated with said second end cap member.
- [c27] The filter housing assembly as defined in claim 23 wherein the single opening extending through the dome shaped portion of said housing member is greater than the opening associated with said second end cap member.
- [c28] The filter housing assembly as defined in claim 22 wherein the size of the single opening extending through the dome shaped portion of said housing member and the size of the opening associated with said second end cap member fall in the range from about 3/16 inch to about 1/4 inch diameter.
- [c29] A filter housing assembly for housing a filter member therewithin comprising: a substantially frusto-conical shaped housing member having an open end portion associated with one end portion thereof and a dome shaped portion associated with the opposite end portion thereof, said housing member having a substantially hollow interior accessible from said open end portion and adaptable for receiving a filter member therewithin, a plurality of openings

extending through the dome shaped portion of said housing member for allowing air to enter said housing member, and a plurality of circumferentially spaced shoulder members associated with the interior of said housing member; a first end cap member adaptable for engaging one end portion of a filter member and being insertable within the interior of said housing member, said first end cap member being engageable with said plurality of shoulder members when inserted within said housing member; and a second end cap member adaptable for engaging the opposite end portion of a filter member, said second end cap member being engageable with said housing member and having an opening associated therewith for allowing air to exit said housing member, said first and second end cap members and said housing member forming a peripheral space around a filter member when said first end cap member and a filter member are positioned within said housing member and said first end cap member engages said plurality of shoulder members and when said second end cap member is engaged with said housing member.

[c30]

A filter assembly for housing a filter member therewithin comprising:
a substantially frusto-conical shaped housing member having an open end portion and a substantially closed dome shaped portion adaptable for receiving a filter member therewithin, said housing member having a substantially hollow interior accessible from said open end portion, and at least one opening extending through the closed dome shaped portion of said housing member for allowing air to enter said housing member;
a filter member adaptable for being housed within the interior of said housing member;
a first end cap member insertable within the interior of said housing member, said first end cap member being attachable to one end portion of said filter member;
a second end cap member attachable to the opposite end portion of said filter member and to the open end portion of said housing member, said second end cap member having an opening associated therewith for allowing air to exit said housing member; and

a plurality of shoulder members associated with the interior of said housing member, said shoulder members being positioned and located to facilitate centering of said filter member within said housing member when said filter member is positioned therewithin;

said filter member when engaged with said first and second end cap members being insertable into said housing member such that said first end cap member engages said plurality of shoulder members, said first and second end cap members and said housing member forming a peripheral space around said filter member, engagement of said first end cap member with said plurality of shoulder members enabling air entering said at least one opening in the substantially closed dome shaped portion of said housing member to travel through said peripheral space.

- [c31] The filter assembly as defined in claim 30 wherein the substantially closed dome shaped portion of said housing member includes a plurality of openings extending therethrough.
- [c32] The filter assembly as defined in claim 30 wherein said at least one opening extending through the substantially closed dome shaped portion of said housing member is positioned and located near the apex thereof.
- [c33] A method for assembling a filtration unit for use on a compressor assembly comprising the following steps:
- (a) selecting a filter member;
 - (b) sealingly attaching one end portion of said filter element to a first end cap member;
 - (c) sealingly attaching the opposite end portion of said filter member to a second end cap member, said second end cap member having an opening associated therewith;
 - (d) inserting said filter member attached to said first and second end cap members within a filter housing member, said filter housing member being substantially frusto-conical in shape and having a substantially hollow interior adaptable for receiving the filter member, said housing member having an open end portion for allowing access to the interior thereof and having a substantially

closed dome shaped portion, at least one opening extending through said dome shaped portion for allowing air to enter said housing member, said housing member further including a plurality of circumferentially spaced projections associated with the interior thereof;

(e) positioning said filter member attached to said first and second end cap members within said housing member such that said first end cap member engages said plurality of spaced shoulder members and said second end cap member engages said housing member; and

(f) sealingly attaching said second end cap member to said housing member.

[c34] The method as defined in claim 33 wherein the one end portion of said filter member is attached to said first end cap member by applying a hot melt adhesive to at least a portion of said first end cap member, and wherein the one end portion of said filter member is thereafter engaged with the hot melt adhesive so as to create an air tight bond therebetween.

[c35] The method as defined in claim 33 wherein the opposite end portion of said filter member is attached to said second end cap member by applying a hot melt adhesive to at least a portion of said second end cap member, and wherein the opposite end portion of said filter member is thereafter engaged with the hot melt adhesive so as to create an air tight bond therebetween.

[c36] The method as defined in claim 33 wherein said second end cap member is attached to said housing member through the use of an ultrasonic weld so as to create an air tight bond therebetween.

[c37] The method as defined in claim 33 wherein said second end cap member includes a tubular portion, the opening associated with said second end cap member extending through said tubular portion, said tubular portion being engageable with a compressor assembly.